

Applicants:

Mukouyama et al.

Application No.: 09/408,142

Filed: September 29, 1999

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PATENT

Attorney Docket No.: HIRA1140

AMENDMENTS

Please cancel claims 9 and 14.

Please enter the following rewritten claims:

- C1
pub
D1
1. A method for producing L-aspartic acid comprising:
treating an ammonium fumarate solution with aspartase to generate an ammonium L-aspartate solution;
heating said ammonium L-aspartate solution until a temperature of said solution reaches a range of between 50 to 130°C;
adding fumaric acid dry crystals, moisture-containing fumaric acid crystals, or fumaric acid aqueous suspension to said heated ammonium L-aspartate solution in a molar ratio of 0.4 to 0.8 to the total amount of fumarate and the L-aspartate contained therein to form a resultant mixture and applying a shearing force to the resultant mixture to obtain a homogenous solution, while maintaining the temperature of said solution between 50°C and 130°C;
cooling or permitting cooling of said homogenous solution to crystallize L-aspartic acid, thereby obtaining suspension containing L-aspartic acid; and
separating L-aspartic acid crystals from said suspension.
 2. The method according to claim 1, wherein the temperature of said suspension containing L-aspartic acid crystals is in the range from 25 to 100°C when the crystallized L-aspartic acid is separated therefrom.
 3. The method according to claim 1, wherein said homogenous solution is maintained at 50 to 130°C for 0.1 second to 1 hour.
 5. The method according to claim 1, wherein said cooling step is performed at a rate of 0.1 - 5°C/min from the temperature at which fumaric acid dry crystals, moisture-containing fumaric
- C2
sub
D2

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C2 ^{Sub D2} acid crystals, or fumaric acid aqueous suspension is added thereto to the temperature at which crystallized L-aspartic acid is separated therefrom, to thereby crystallize L-aspartic acid.

C3 10. A method for producing L-aspartic acid comprising:

^{Sub D4} treating an ammonium fumarate solution with aspartase to generate an ammonium L-aspartate solution;

heating said ammonium L-aspartate solution until a temperature of said solution reaches a range of between 50 to 130°C;

adding fumaric acid dry crystals, moisture-containing fumaric acid crystals, or fumaric acid aqueous suspension to said ammonium L-aspartate solution; and

cooling or permitting cooling of said resultant mixture at a rate of 0.1 to 5 °C/min from the temperature at which fumaric acid dry crystals, moisture-containing fumaric acid crystals, or fumaric acid aqueous suspension is added thereto to crystallize L-aspartic acid for crystallizing L-aspartic acid, thereby obtaining suspension containing L-aspartic acid; and separating L-aspartic acid crystals from said suspension.

Please enter the following new claims:

C4 15. The method according to claim 1, ^F wherein said separating step is performed by filtration.

16. The method according to claim 1, further comprising washing the L-aspartic acid crystals obtained in said separating step with water.

^{Sub D5} 17. The method according to claim 15, wherein a mother liquor obtained by said filtration is recycled as a substrate solution for L-aspartic acid production.

18. The method according to claim 17, wherein the recycling of a mother liquor obtained by said filtration is repeated 2 times, or more.

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- C4
19. The method according to claim 16, further comprising recycling of a washing liquid obtained by said washing step.
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20. The method according to claim 8, wherein said continuous method is performed by feeding said homogenous solution in suspension containing L-aspartic acid and evaporating said suspension to remove water under reduced pressure.
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